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OFFICE, WHITE SANDS MISSILE RANGE, NEW MEXICO.

DR-376  
November 1968  
AD

METEOROLOGICAL DATA REPORT

NIKE-HYDAC STV, SR-077  
(24 October 1968)

BY

GEORGE M. FUGATE

DEC 16 1968

ATMOSPHERIC SCIENCES RESEARCH OFFICE  
WHITE SANDS MISSILE RANGE, NEW MEXICO

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UNITED STATES ARMY ELECTRONICS COMMAND

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DA Task 1T665702D127-02

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WHITE SANDS MISSILE RANGE, NEW MEXICO

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## ABSTRACT

Meteorological data gathered for the launching of Nike-Hyac STV, SR-077, are presented for the Space and Missile Systems Organization, AFMDC, Holloman Air Force Base, New Mexico, and for ballistic studies. The data appear, along with calculated ballistic data, in tabular form.

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## INTRODUCTION

Nike-Hydac STV, SR-077, was launched from Launch Complex 33, L-314, White Sands Missile Range (WSMR), New Mexico, at 0703 hours MDT, 24 October 1968.

Meteorological data used in conjunction with theoretical calculations to predict rocket impact were collected by the Meteorological Support Technical Area, Atmospheric Sciences Research Office, WSMR, New Mexico. The Ballistics Meteorologists for this firing were Harold M. Richart and George M. Fugate.

## DISCUSSION

Wind data for the first 216 feet above the surface were obtained from a system composed of five Aerovanes mounted on a 200-foot tower and cabled to two component wind indicators for each level.

From 216 to 4,000 feet above the surface, wind data were obtained from T-9 radar-tracked balloon ascents.

Temperature, pressure, and humidity data, along with upper wind data from 4,000 to 100,000 feet above the surface, were obtained from standard rawinsonde observations.

Mean wind component values in each ballistic zone were determined from vertical cross sections by the equal-area method.

Theoretical rocket performance values and ballistic factors as a function of altitude were provided by Meteorological Support Technical Area, WSMR, New Mexico, and are the basis for data appearing in Table I.

PAYOUT		217	Pounds
CORIOLIS DISPLACEMENT	WEST.	4.9	MILES
SECOND-STAGE IGNITION	TIME	20.0	Seconds
PEAK	ALTITUDE	35,760	Feet MSL
	TIME	236	Seconds
UNIT WIND EFFECT	ALTITUDE	716,000	Feet MSL
	HEAD	2.158	MILES/MPH
	CROSS	2.244	MILES/MPH
	TAIL	2.167	MILES/MPH
TOWER TILT EFFECT		14.5	MILES/Degrees

TABLE I. THEORETICAL ROCKET PERFORMANCE VALUES  
NIKE-HYDRA STV, SR-077

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS
15- 60	.126
60- 108	.084
108- 148	.053
148- 184	.041
184- 216	.026
216- 300	.062
300- 400	.058
400- 600	.072
600- 800	.058
800-1000	.039

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS
1000- 1400	.063
1400- 2000	.066
2000- 2500	.035
2500- 3000	.028
3000- 3500	.014
3500- 4000	.005
4000- 4160	-.003
4160- 9000	-.014
9000-15000	-.017
15000-21000	-.016

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS
21000-26000	-.013
26000-31770	-.016
31770-36000	.129
36000-41000	.057
41000-46000	.026
46000-51000	.015
51000-56000	.010
56000-61000	.006
61000-66000	.004
66000-69330	.002

TABLE II. BALLISTIC FACTORS  
NIKE-HYDAC STV, SR-077

AERO-VANE NO.*	MEAN WIND COMPONENTS IN MILES PER HOUR							
	1 0507 MDT	2 0517 MDT	3 0552 MDT	4 0610 MDT	5 0620 MDT			
N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	
1	11.0S	3.0E	15.0S	3.0W	10.0S	2.0W	8.0S	3.0W
2	15.0	2.0	18.0	3.0	12.0	4.0	12.0	5.0
3	19.0	2.0	18.0	0.0	14.0	3.0	14.0	3.0
4	19.0	1.0	18.0	0.0	15.0	2.0	14.0	4.0
5	20.0	1.0	22.0	1.0	17.0	2.0	16.0	3.0

AERO-VANE NO.*	MEAN WIND COMPONENTS IN MILES PER HOUR							
	6 0630 MDT	7 0640 MDT	8 0650 MDT	9 0705 MDT				
N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	
1	8.0S	4.0W	8.0S	0.0	8.0S	2.0W	6.0S	4.0W
2	10.0	6.0	10.0	1.0W	9.0	4.0	9.0	5.0
3	12.0	5.0	8.0	0.0	10.0	3.0	10.0	4.0
4	12.0	6.0	9.0	0.0	12.0	3.0	10.0	4.0
5	15.0	5.0	13.0	2.0E	12.0	2.0	12.0	4.0

TABLE III. ANEMOMETER WIND SPEED AND DIRECTION  
NIKE-HYDAC STV, SR-077

\* Heights corresponding to Aerovane Numbers: 1 = 35 Feet 3 = 128 Feet  
2 = 88 Feet 4 = 200 Feet  
5 = 168 Feet

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN MILES PER HOUR							
	1 0507 MDT		2 0517 MDT		3 0552 MDT		4 0610 MDT	
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
216- 300	19.0S	1.5E	21.5S	0.0	16.5S	0.5W	16.0S	3.0W
300- 400	18.0	2.5	20.5	3.0E	16.0	2.0E	16.5	1.0
400- 600	15.0	4.0	19.5	7.5	15.5	6.0	17.5	4.0E
600- 800	14.0	6.5	18.0	13.5	14.5	10.5	14.0	14.0
800-1000	9.0	8.0	12.5	21.0	13.5	15.0	11.5	11.5
1000-1400	6.0	11.0	8.0	23.0	11.5	21.0	11.5	11.5
1400-2000	8.0	15.5	5.0	23.0	9.0	28.0	12.5	22.0
2000-2500	4.0	17.5	3.0	24.5	11.0	21.0	12.5	12.5
2500-3000	2.0	19.5	3.5	18.5	7.0	15.0	7.5	19.0
3000-3500	1.0N	15.0	4.0	14.0	8.5	10.0	7.5	15.5
3500-4000	2.0S	10.0	7.0	6.5	6.5	2.0	6.0	11.0

TABLE IV. PILOT-BALLOON-MEASURED WIND DATA  
NIKE-HYDAC STV, SR-077

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN MILES PER HOUR							
	6 0630 MDT		7 0640 MDT		8 0650 MDT		9 0705 MDT	
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
216- 300	15.0S	5.0W	13.0S	2.0E	12.0S	2.0W	12.0S	4.0W
300- 400	13.0	4.0	11.0	1.0	12.0	2.0	11.5	3.5
400- 600	13.5	3.0	11.5	2.0	12.5	2.0	11.0	0.0
600- 800	15.5	4.0E	12.0	1.0	13.5	3.0	10.0	5.0
800-1000	17.0	10.0	11.0	5.0	10.0	6.0	9.5	9.0
1000-1400	13.0	19.0	11.5	15.0	12.0	11.0	10.5	12.0
1400-2000	13.5	26.0	11.5	26.0	12.5	22.0	12.0	23.0
2000-2500	15.5	24.0	16.5	24.0	17.0	24.0	17.5	23.0
2500-3000	12.5	15.0	15.0	15.0	16.5	18.0	16.5	14.0
3000-3500	8.5	6.0	13.0	10.0	12.5	9.0	12.0	9.0
3500- 3000	7.5	4.0	8.5	4.0	7.5	6.0	8.5	5.0

TABLE IV. PILOT-BALLOON-EQUIPPED WIND DATA (CONT.)  
NIKE-HYDAG STV, SR-077

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN KNOTS					
	1		2		3	
	N-E	E-W	N-E	E-W	N-E	E-W
4000- 4160	5.55	4.30	1.5N	0.0E		
160- 9000	0.0	8.0W	10.5	6.0W		
9030-15030	13.0N	5.0	17.0	6.0		
15000-21300	21.5	8.0	26.0	0.0		
21000-26000	25.0	9.0	31.0	0.0		
26000-31770	31.5	5.5E	32.5	5.5E		
31770-36000	31.5	26.5E	32.0	18.5		
36000-41000	36.5	21.0	34.0	19.5		
41000-46000	31.5	5.5W	40.0	0.0		
46000-51000	29.5	3.0	32.0	0.0		
51000-56000	16.5	3.0	17.0	0.0		
56000-61000	8.0	1.5E	19.0	2.5E		
61000-66000	5.0	3.0W	3.5	2.0		
66000-69330	5.0	0.0	2.5E	1.5		

TABLE V. RAININSONDE-MEASURED WIND DATA  
NIKE-HYDAG STV., SR-07/

TATION ALTITUDE 3989.00 FEET MSL  
 14 OCT. 68 0350 HRS MDT  
 ASCENSION NO. 867

SIGNIFICANT LEVEL DATA  
 0820003904  
 WHITE SANDS SITE

WSTM SITE COORDINATES  
 400500.00000 E  
 105045.00000 N

TABLE VI

PRESSURE GEOMETRIC MILLIBARS MSL FEET	ALTITUDE DEGREES MSL FEET	TEMPERATURE AIR DEWPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT
885.3	3989.0	11.8	-3.6 34.0
875.0	4311.0	13.0	-2.1 35.0
850.0	5108.1	11.3	-3.2 36.0
826.0	5895.0	12.5	-3.3 33.0
732.0	9180.9	7.0	-7.6 34.0
710.0	10012.8	7.0	-8.6 32.0
648.0	12492.0	0.9	-12.9 35.0
616.0	13789.1	0.4	-14.1 33.0
530.0	17752.8	-6.5	-19.5 35.0
422.0	23429.1	-18.2	-31.3 31.0
304.0	31160.1	-30.9	-50.1 30.0
220.0	38180.7	-57.1	-0. * * *
172.0	43159.3	-69.9	-0. * * *
144.0	46640.0	-70.5	-0. * * *
132.0	48334.2	-72.5	-0. * * *
130.0	48630.1	-72.5	-0. * * *
124.0	49557.2	-67.5	-0. * * *
91.0	55694.2	-60.1	-0. * * *
82.0	57785.1	-62.7	-0. * * *
71.0	60695.0	-65.6	-0. * * *
47.0	69137.0	-57.4	-0. * * *
40.0	72486.7	-59.6	-0. * * *
37.0	74108.8	-56.8	-0. * * *
33.0	76492.4	-59.1	-0. * * *
29.0	79194.4	-55.3	-0. * * *
11.0	99917.0	-49.6	-0. * * *

\*\* RELATIVE HUMIDITY NOT SUPPLIED. ZERO VALUE ASSUMED FOR COMPUTATIONS.

STATION ALTITUDE 3989.00 FEET MSL  
24 OCT. 68 0350 HRS, MDT  
ASCENSION NO. 867

UPPER AIR DATA  
0820003904  
WHITE SANDS SITE

W STN SITE COORDINATES  
488580.00FEET E  
185045.00FEET N

TABLE VII

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	DEWPOINT DEGREES	REL.HUM. PERCENT	SPEED OF SOUND METER KNOTS	WIND DATA DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
3989.0	885.3	11.8	-3.6	34.0	1080.3	657.9	210.0	1.000263
4000.0	884.9	11.8	-3.5	34.0	1079.7	658.0	209.5	7.0
4500.0	869.0	12.6	-2.4	35.2	1057.2	658.9	184.8	8.2
5000.0	853.3	11.5	-3.1	35.9	1042.1	657.7	160.2	9.3
5500.0	838.0	11.9	-3.3	34.5	1022.0	658.1	135.6	10.5
6000.0	822.8	12.3	-3.5	33.0	1002.1	658.6	111.0	1.000245
6500.0	807.9	11.5	-4.2	33.2	986.8	657.6	112.5	1.000241
7000.0	793.2	10.7	-4.8	33.3	971.8	656.6	115.3	1.000237
7500.0	778.8	9.8	-5.5	33.5	957.0	655.6	119.4	9.5
8000.0	764.6	9.0	-6.2	33.6	942.5	654.7	127.7	7.6
8500.0	750.7	8.2	-6.9	33.8	928.1	653.7	141.0	4.6
9000.0	737.1	7.3	-7.6	33.9	914.0	652.7	213.7	3.5
9500.0	723.6	7.0	-8.1	33.2	898.4	652.3	296.0	3.5
10000.0	710.3	7.0	-8.6	32.0	881.9	652.3	305.0	6.3
10500.0	697.2	5.8	-9.4	32.6	869.4	650.8	309.6	8.7
11000.0	684.2	4.5	-10.3	33.2	857.2	649.4	309.7	10.6
11500.0	671.5	3.3	-11.2	33.8	845.2	647.9	311.9	12.0
12000.0	659.1	2.0	-12.1	34.4	833.3	646.4	314.6	13.2
12500.0	646.8	0.9	-12.9	34.9	821.3	645.0	318.5	12.6
13000.0	634.7	0.7	-13.4	34.2	806.5	644.8	322.3	12.4
13500.0	622.8	0.5	-13.8	33.4	791.9	644.5	326.0	13.4
14000.0	611.0	0.0	-14.3	33.1	778.3	644.0	329.5	13.8
14500.0	599.4	-0.9	-15.0	33.4	766.0	642.9	332.8	13.7
15000.0	588.0	-1.7	-15.7	33.6	753.9	641.9	333.9	14.1
15500.0	576.8	-2.6	-16.4	33.9	742.0	640.8	334.5	14.5
16000.0	565.8	-3.5	-17.1	34.1	730.3	639.7	335.4	13.3
16500.0	555.1	-4.4	-17.8	34.4	718.8	638.7	337.8	12.3
17000.0	544.5	-5.3	-18.5	34.6	707.5	637.6	342.4	11.8
17500.0	534.1	-6.1	-19.2	34.9	696.3	636.6	346.2	12.0
18000.0	523.8	-7.1	-20.1	34.8	685.3	635.4	349.4	12.7

STATION ALTITUDE 3989.00 FEET MSL  
24 OCT 68 0350 HRS MDT  
ASCENSION NO. 867

UPPER AIR DATA  
082000Z 3904  
WHITE SANDS SITE

WSTM SITE COORDINATES  
488580.00FEET E  
185045.00FEET N

TABLE VII (cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEWEPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DIRECTION DEGREES(TH)	WIND SPEED KNOTS	INDEX OF REFRACTION
18500.0	513.4	-8.1	-21.1	34.4	674.5	634.2	352.0	14.3
19000.0	503.3	-9.2	-22.2	34.1	653.8	632.9	354.4	16.1
19500.0	493.4	-10.2	-23.2	33.7	653.2	631.7	351.8	17.4
20000.0	483.7	-11.2	-24.2	33.4	642.9	630.4	348.5	18.6
20500.0	474.2	-12.2	-25.3	33.0	632.7	629.2	344.5	20.1
21000.0	464.8	-13.2	-26.3	32.7	622.7	627.9	340.5	21.4
21500.0	455.7	-14.3	-27.3	32.3	612.9	626.7	336.6	21.9
22000.0	446.7	-15.3	-28.4	32.0	603.2	625.4	333.2	21.3
22500.0	437.9	-16.3	-29.4	31.6	593.7	624.2	330.9	18.6
23000.0	429.3	-17.3	-30.4	31.3	584.4	622.9	331.2	19.2
23500.0	420.7	-18.4	-31.5	31.0	575.2	621.6	334.6	22.9
24000.0	411.9	-19.7	-32.7	30.9	556.1	620.0	337.6	24.8
24500.0	403.3	-21.1	-33.9	30.9	557.2	618.3	340.3	25.7
25000.0	394.8	-22.4	-35.1	30.8	548.4	616.7	341.2	29.3
25500.0	386.5	-23.7	-36.3	30.7	539.8	615.0	341.6	33.2
26000.0	378.4	-25.1	-37.5	30.7	531.3	613.3	340.1	29.6
26500.0	370.5	-26.4	-38.7	30.6	523.0	611.7	338.8	26.6
27000.0	362.7	-27.8	-40.0	30.5	514.8	610.0	337.6	26.5
27500.0	355.1	-29.1	-41.2	30.5	506.8	608.3	337.1	26.5
28000.0	347.6	-30.4	-42.4	30.4	498.9	606.7	337.9	26.5
28500.0	340.3	-31.8	-43.6	30.3	491.2	605.0	339.1	26.6
29000.0	333.2	-33.1	-44.8	30.3	483.6	603.3	340.7	27.4
29500.0	326.2	-34.5	-46.0	30.2	476.1	601.6	342.8	28.0
30000.0	319.3	-35.8	-47.3	30.2	468.7	599.9	345.6	28.5
30500.0	312.6	-37.1	-48.5	30.1	451.5	598.2	348.5	28.9
31000.0	306.1	-38.5	-49.7	30.0	454.4	596.5	351.7	29.0
31500.0	299.3	-39.8	-51.3	28.5**	466.8	594.9	356.1	29.5
32000.0	292.5	-41.1	-53.1	26.4**	439.1	593.2	1.5	30.2
32500.0	285.8	-42.4	-55.0	24.3**	431.5	591.5	6.9	30.6
33000.0	279.3	-43.7	-56.8	22.1**	424.0	589.9	12.2	30.8

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
 24 OCT. 68 0350 HRS MDT  
 ASCENSION NO. 867

UPPER AIR DATA  
 082000 3904  
 WHITE SANDS SITE

WSTM SITE COORDINATES  
 488580.00FEET E  
 185045.00FEET N

TABLE VII (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEWPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT	SOUND METER	SPEED OF SOUND KNOTS	DIRECTION DEGREES(TW)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION	
								1.000093	1.000093
33500.	0	272.9	-45.0	-58.8	20.0**	416.7	508.2	16.8	31.7
34000.	0	266.7	-46.3	-60.8	17.9**	409.6	586.5	20.9	33.1
34500.	0	260.6	-47.6	-62.8	15.7**	402.6	584.8	23.6	34.1
35000.	0	254.7	-48.9	-65.0	13.6**	395.7	583.2	25.1	34.9
35500.	0	248.9	-50.2	-67.3	11.5**	380.9	581.5	26.0	35.6
36000.	0	243.2	-51.4	-69.8	9.3**	382.3	579.8	25.9	36.4
36500.	0	237.7	-52.7	-72.6	7.2**	375.8	578.1	25.9	37.1
37000.	0	232.3	-54.0	-76.0	5.0**	359.4	576.4	26.5	37.5
37500.	0	227.0	-55.3	-80.4	2.9**	363.1	574.7	27.1	37.9
38000.	0	221.8	-56.6	-88.9	0.8**	357.0	573.0	27.9	39.0
38500.	0	216.6	-57.9	0.	-0.**	350.6	571.2	28.6	40.3
39000.	0	211.3	-59.2	0.	-0.**	344.1	569.5	29.7	40.6
39500.	0	206.1	-60.5	0.	-0.**	337.7	567.8	30.9	40.7
40000.	0	201.1	-61.8	0.	-0.**	331.4	566.1	30.9	40.7
40500.	0	196.2	-63.1	0.	-0.**	325.3	564.4	30.9	40.6
41000.	0	191.4	-64.1	0.	-0.**	319.3	562.7	29.7	40.3
41500.	0	186.7	-65.6	0.	-0.**	313.5	560.9	28.6	40.0
42000.	0	182.1	-66.9	0.	-0.**	307.7	559.2	25.7	40.0
42500.	0	177.7	-68.2	0.	-0.**	302.1	557.4	22.5	40.1
43000.	0	173.4	-69.5	0.	-0.**	296.6	555.7	19.5	40.4
43500.	0	169.0	-70.0	0.	-0.**	289.8	555.0	16.9	41.1
44000.	0	164.8	-70.5	0.	-0.**	282.7	554.9	14.3	41.9
44500.	0	160.6	-70.1	0.	-0.**	275.7	554.8	12.6	40.5
45000.	0	156.6	-70.2	0.	-0.**	268.8	554.7	11.1	38.8
45500.	0	152.6	-70.3	0.	-0.**	262.2	554.6	8.8	37.1
46000.	0	148.8	-70.4	0.	-0.**	255.7	554.5	3.3	35.2
46500.	0	145.0	-70.5	0.	-0.**	249.3	554.3	357.8	33.4
47000.	0	141.4	-70.9	0.	-0.**	243.6	553.7	352.0	31.7
47500.	0	137.8	-71.5	0.	-0.**	238.1	552.9	345.8	30.0
48000.	0	134.3	-72.1	0.	-0.**	232.7	552.1	339.6	28.4

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3984.00 FEET MST  
24 OCT. 68 0350 HRS MDT  
ASCENSION NO. 867

UPPER AIR DATA  
082000Z 3904  
WHITE SANDS SITE

WEST SITE COORDINATES  
488580, 00FEET E  
185045, 00FEET N

TABLE VII (Cont.)

GEOMETRIC ALTITUDE MSL. FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREE CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	INDEX OF REFRACTION
48500.0	130.9	-72.5	0.	**	227.3	551.6	29.0
49000.0	127.6	-70.5	0.	0.	219.3	554.3	30.1
49500.0	124.4	-67.8	0.	**	211.0	558.0	33.5
50000.0	121.3	-67.5	0.	0.	205.5	558.3	33.6
50500.0	118.2	-67.6	0.	0.	200.4	558.3	33.9
51000.0	115.3	-67.6	0.	**	195.5	558.2	34.3
51500.0	112.4	-67.7	0.	0.	190.7	558.1	34.5
52000.0	109.6	-67.7	0.	0.	186.0	558.1	34.6
52500.0	106.9	-67.8	0.	0.	181.4	558.0	34.5
53000.0	104.2	-67.8	0.	0.	176.9	557.9	34.4
53500.0	101.6	-67.9	0.	0.	172.5	557.9	34.4
54000.0	99.1	-67.9	0.	0.	168.3	557.8	34.5
54500.0	96.6	-68.0	0.	0.	164.1	557.7	34.7
55000.0	94.2	-68.0	0.	0.	160.1	557.7	34.8
55500.0	91.9	-68.1	0.	0.	156.1	557.6	34.8
56000.0	89.6	-67.3	0.	0.	151.7	558.6	34.8
56500.0	87.4	-66.0	0.	0.	147.0	560.4	34.6
57000.0	85.3	-64.7	0.	0.	142.5	562.1	34.5
57500.0	83.2	-63.4	0.	0.	138.2	563.9	34.2
58000.0	81.1	-62.9	0.	0.	134.5	564.6	34.0
58500.0	79.1	-63.4	0.	0.	131.5	563.9	33.8
59000.0	77.2	-63.9	0.	0.	128.6	563.2	33.8
59500.0	75.3	-64.4	0.	0.	125.7	562.6	33.9
60000.0	73.5	-64.9	0.	0.	122.9	561.9	34.2
60500.0	71.7	-65.4	0.	0.	120.2	561.2	34.8
61000.0	69.9	-65.3	0.	0.	117.3	561.4	35.4
61500.0	68.3	-64.8	0.	0.	114.2	562.0	35.5
62000.0	66.6	-64.3	0.	0.	111.1	562.7	35.5
62500.0	65.0	-63.8	0.	0.	108.2	563.3	35.5
63000.0	63.4	-62.4	0.	0.	105.4	564.0	35.8

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FFFF MSL  
24 OCT. 68 0350 HRS MDT  
ASCENSION NO. 867

UPPER AIR DATA  
0820003904  
WHITE SANDS SITE

WSTM SITE COORDINATES  
488580.00FEET E  
185045.00FEET N

TABLE VII (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREEES CENTIGRADE	REL.HUM. PERCENT	DENSITY GM/CUBIC METER	SOUND SPEED KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND SPEED KNOTS	INDEX OF REFRACTION
63500.0	61.9	-62.9	0.	-0.	564.6	2.2	8.1	
64000.0	60.4	-62.4	0.	-0.	565.3	6.4	7.0	1.000022
64500.0	59.0	-61.9	0.	-0.	565.9	11.0	5.8	1.000022
65000.0	57.5	-61.4	0.	-0.	566.6	14.9	4.8	1.000021
65500.0	56.1	-60.9	0.	-0.	567.2	14.2	5.0	1.000021
66000.0	54.8	-60.4	0.	-0.	567.9	13.5	5.2	1.000020
66500.0	53.5	-60.0	0.	-0.	568.5	354.8	4.8	1.000019
67000.0	52.2	-59.5	0.	-0.	569.2	327.8	4.0	1.000019
67500.0	50.9	-59.0	0.	-0.	569.8	303.8	3.4	1.000018
68000.0	49.7	-58.5	0.	-0.	570.5	288.7	3.4	1.000018
68500.0	48.5	-58.0	0.	-0.	571.1	273.7	3.4	1.000017
69000.0	47.3	-57.5	0.	-0.	571.8	263.2	3.2	1.000017
69500.0	46.2	-57.6	0.	-0.	571.6	253.9	3.0	1.000017
70000.0	45.1	-58.0	0.	-0.	571.2	246.8	2.7	1.000016
70500.0	44.0	-58.3	0.	-0.	570.7	248.0	2.0	1.000016
71000.0	43.0	-58.6	0.	-0.	570.3	249.2	1.2	1.000016
71500.0	41.9	-59.0	0.	-0.	569.9	256.1	1.0	1.000015
72000.0	40.9	-59.3	0.	-0.	569.4	271.9	1.3	1.000015
72500.0	40.0	-59.6	0.	-0.	569.0	287.7	2.6	1.000015
73000.0	39.0	-58.7	0.	-0.	570.2	296.0	2.8	1.000014
73500.0	38.1	-57.9	0.	-0.	571.3	297.7	2.3	1.000014
74000.0	37.2	-57.0	0.	-0.	572.5	299.4	1.8	1.000013
74500.0	36.3	-57.2	0.	-0.	572.2	317.7	1.7	1.000013
75000.0	35.5	-57.7	0.	-0.	571.6	344.6	1.9	1.000013
75500.0	34.6	-58.1	0.	-0.	571.0	11.4	2.0	1.000012
76000.0	33.8	-58.6	0.	-0.	570.3	39.6	2.3	1.000012
76500.0	33.0	-59.1	0.	-0.	569.7	68.0	2.5	1.000012
77000.0	32.2	-58.4	0.	-0.	570.6	96.5	2.7	1.000012
77500.0	31.4	-57.7	0.	-0.	571.6	67.2	2.1	1.000011
78000.0	30.7	-57.0	0.	-0.	572.5	32.2	1.3	1.000011

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
24 OCT. 68 0350 HRS MDT  
ASCENSION NO. 867

UPPER AIR DATA  
082000Z 0904  
WHITE SANDS SITE

WEATHER SITE COORDINATES  
480560.00E 35°  
105045.00E 27N

TABLE VII (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	DEWPOINT CENTIGRADE	REL. HUM. PERCENT	SPEED OF SOUND METER KNOTS	WIND DIRECTION DEGREES (TN)	WIND SPEED KNOTS	INDEX OF REFRACTION	
								REFRACTION	REFRACTION
78500.0	30.0	-56.3	0.	-0.	4.8-2	573.4	356.9	0.6	1.000011
79000.0	29.3	-55.6	0.	-0.	4.6-9	574.4	314.0	2.4	1.000010
79500.0	28.6	-55.2	0.	-0.	4.5-7	574.8	271.1	4.1	1.000010
80000.0	27.9	-55.1	0.	-0.	4.4-6	575.0	234.2	5.8	1.000010
80500.0	27.3	-54.9	0.1	-0.	4.3-6	575.2	231.7	7.3	1.000010
81000.0	26.7	-54.8	0.1	-0.	4.2-5	575.4	229.3	8.7	1.000009
81500.0	26.0	-54.7	0.1	-0.	4.1-5	575.5	227.0	10.3	1.000009
82000.0	25.4	-54.5	0.1	-0.	4.0-5	575.7	228.4	12.6	1.000009
82500.0	24.8	-54.4	0.1	-0.	3.9-6	575.9	223.7	14.8	1.000009
83000.0	24.3	-54.3	0.1	-0.	3.8-6	576.1	223.2	16.2	1.000009
83500.0	23.7	-54.1	0.1	-0.	3.7-7	576.3	223.7	16.9	1.000008
84000.0	23.2	-54.0	0.1	-0.	3.6-8	576.5	224.2	17.6	1.000008
84500.0	22.6	-53.8	0.1	-0.	3.5-9	576.6	227.2	18.9	1.000008
85000.0	22.1	-53.7	0.1	-0.	3.5-1	576.8	231.1	20.4	1.000008
85500.0	21.6	-53.6	0.1	-0.	3.4-3	577.0	235.1	21.9	1.000008
86000.0	21.1	-53.4	0.1	-0.	3.3-4	577.2	239.0	22.4	1.000007
86500.0	20.6	-53.3	0.1	-0.	3.2-7	577.4	242.9	22.9	1.000007
87000.0	20.1	-53.2	0.1	-0.	3.1-9	577.5	246.6	23.5	1.000007
87500.0	19.7	-53.0	0.1	-0.	3.1-1	577.7	249.3	24.7	1.000007
88000.0	19.2	-52.9	0.1	-0.	3.0-4	577.9	251.9	26.0	1.000007
88500.0	18.8	-52.7	0.1	-0.	2.9-7	578.1	253.2	26.7	1.000007
89000.0	18.3	-52.6	0.1	-0.	2.9-0	578.3	252.2	26.2	1.000006
89500.0	17.9	-52.5	0.1	-0.	2.8-3	578.4	251.2	25.7	1.000006
90000.0	17.5	-52.3	0.1	-0.	2.7-6	578.6	250.0	25.2	1.000006
90500.0	17.1	-52.2	0.1	-0.	2.6-9	578.8	248.6	24.8	1.000006
91000.0	16.7	-52.1	0.1	-0.	2.6-3	579.0	247.3	24.4	1.000006
91500.0	16.3	-51.9	0.1	-0.	2.5-7	579.2	246.6	24.3	1.000006
92000.0	15.9	-51.8	0.1	-0.	2.5-1	579.3	246.2	24.3	1.000006
92500.0	15.6	-51.6	0.1	-0.	2.4-5	579.5	245.7	24.2	1.000005
93000.0	15.2	-51.5	0.1	-0.	2.3-9	579.7	247.6	25.3	1.000005

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
 24 OCT. 68 0350 HRS MDT  
 ASCENSION NO. 867

UPPER AIR DATA  
 082000Z3904  
 WHITE SANDS SITE

WSTM SITE COORDINATES  
 488580.00FEET E  
 185045.00FEET N

TABLE VII (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREE CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	DIRECTION DEGREES(TN)	WIND SPEED KNOTS	INDEX OF REFRACTION
93500.0	14.9	-51.4	0.	**	23.3	579.9	249.5	26.5
94000.0	14.5	-51.2	C.	-0.	22.8	580.1	251.3	27.4
94500.0	14.2	-51.1	C.	-0.	22.2	580.2	252.2	27.8
95000.0	13.8	-51.0	0.	**	21.7	580.4	253.1	28.2
95500.0	13.5	-50.8	0.	-0.	21.2	580.6	254.0	28.9
96000.0	13.2	-50.7	0.	**	20.7	580.8	255.0	30.0
96500.0	12.9	-50.5	0.	-C.	20.2	581.0	255.9	31.1
97000.0	12.6	-50.4	0.	-0.	19.7	581.1		
97500.0	12.3	-50.3	0.	-0.	19.3	581.3		
98000.0	12.0	-50.1	0.	-0.	18.8	581.5		
98500.0	11.8	-50.0	C.	-0.	18.4	581.7		
99000.0	11.5	-49.9	0.	-0.	17.9	581.9		
99500.0	11.2	-49.7	C.	-0.	17.5	582.0		

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
24 OCT. 68 0350 HRS MDT  
ASCENSION NO. 867

MANDATORY LEVELS  
0820003904  
WHITE SANDS SITE

WSTN SITE COORDINATES  
488580.0000E  
185045.0000N

TABLE VIII

PRESSURE MILLIBARS	GEOPOTENTIAL FEET	TEMPERATURE		REL.HUM. PERCENT	WIND DATA	
		AIR DEGREES	DEWPNT CENTIGRADE		DIRECTION DEGREES( TN )	SPEED KNOTS
850.0	5107.	11.3	-3.2	36.	154.9	9.6
800.0	6770.	11.0	-4.5	33.	113.8	10.9
750.0	8527.	8.1	-6.9	34.	141.8	4.5
700.0	10389.	6.1	-9.2	32.	309.6	8.3
650.0	12362.	1.1	-12.7	35.	317.4	12.8
600.0	14469.	-0.8	-15.0	33.	332.7	13.7
550.0	16732.	-4.8	-18.1	35.	340.0	12.1
500.0	19171.	-9.5	-22.5	34.	353.8	16.7
450.0	21815.	-14.9	-28.0	32.	334.0	22.1
400.0	24704.	-21.6	-34.4	31.	340.9	27.1
350.0	27879.	-30.0	-42.0	30.	337.8	26.5
300.0	31409.	-39.6	-51.1	29.**	355.6	29.4
250.0	35411.	-49.9	-66.9	12.**	26.0	35.5
200.0	40065.	-62.1	0.	-0.**	30.9	40.7
175.0	42729.	-69.0	0.	-0.**	20.4	40.1
150.0	45736.	-70.4	0.	-0.**	5.1	35.8
125.0	49278.	-68.3	0.	-0.**	335.1	30.7
100.0	53683.	-67.9	0.	-0.**	345.4	27.9
80.0	58120.	-63.2	0.	-0.**	339.2	16.4
70.0	60798.	-65.3	0.	-0.**	354.1	13.3
60.0	63899.	-62.3	0.	-0.**	7.2	6.8
50.0	67626.	-58.6	0.	-0.**	293.4	3.4
40.0	77234.	-59.6	0.	-0.**	287.2	2.6
30.0	78182.	-56.3	0.	-0.**	358.9	0.6
25.0	82003.	-54.4	0.	-0.**	224.3	14.0
20.0	86707.	-53.1	0.	-0.**	247.0	23.6
15.0	92814.	-51.4	0.	-0.**	248.5	25.8

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

TATION ALTITUDE 3989.00 FEET MSL  
14 OCT. 68 0705 HRS MDT  
SCENSION NO. 868

SIGNIFICANT LEVEL DATA  
0800003904  
WHITE SANDS SITE

WSTM SITE COORDINATES  
480580.00FEET E  
185C45.00FEET N

TABLE IX

PRESSURE MILLIBARS	GEOMETRIC ALTITUDE MSL FEET	TEMPERATURE DEGREES	AIR DEWPOINT DEGREES	CENTIGRADE	REL.HUM. PERCENT
887.0	3989.0	9.0	-2.0	46.0	
877.0	4298.9	11.7	0.2	45.0	
764.0	8052.7	6.5	-2.6	52.0	
740.0	8911.0	5.0	-5.7	46.0	
732.0	9203.6	7.1	-6.3	38.0	
583.0	15260.2	-1.1	-15.4	33.0	
524.0	18027.8	-6.9	-18.9	38.0	
496.0	19433.3	-8.3	-22.9	30.0	
484.0	20057.2	-9.3	-25.8	25.0	
410.0	24203.0	-18.4	-33.3	26.0	
295.0	31954.7	-39.2	-50.1	31.0	
240.0	36494.1	-50.8	0*	-0.**	
184.0	42027.8	-63.7	0*	-0.**	
147.0	46465.4	-73.0	0*	-0.**	
140.0	47414.0	-70.6	0*	-0.**	
124.0	49775.4	-72.7	0*	-0.**	
117.0	50913.1	-68.2	0*	-0.**	
102.0	53632.0	-67.8	0*	-0.**	
92.0	55695.8	-64.5	0*	-0.**	
82.0	58008.9	-65.8	0*	-0.**	
75.0	59804.2	-64.2	0*	-0.**	
63.0	63326.4	-64.2	0*	-0.**	
61.0	63934.9	-60.0	0*	-0.**	
54.0	64488.3	-61.6	0*	-0.**	
43.0	71204.0	-56.7	0*	-0.**	
30.0	78763.2	-55.7	0*	-0.**	
27.0	80995.9	-53.0	0*	-0.**	
21.0	86311.9	-56.6	0*	-0.**	
16.0	92073.6	-52.5	0*	-0.**	
11.0	100111.3	-51.4	0*	-0.**	
7.1	109711.7	-43.0	0*	-0.**	

\*\* RELATIVE HUMIDITY NOT SUPPLIED. ZERO VALUE ASSUMED FOR COMPUTATIONS.

STATION ALTITUDE 3989.00 FEET MSL  
24 OCT. 68 0705 HRS MDT  
ASCENSION NO. 068

UPPER AIR DATA  
080000Z 3904  
WHITE SANDS SITE  
TABLE X

WSTM SITE COORDINATES  
488580.00FEET E  
185043.00FEET N

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEWPPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(YN)	WIND SPEED KNOTS	INDEX OF REFRACTION
3989.0	887.0	9.0	-2.0	46.0	1092.9	654.8	210.0	1.000269
4000.0	886.6	9.1	-1.9	46.0	1092.0	654.9	209.6	1.000269
4500.0	870.5	11.4	0.0	45.4	1063.0	657.7	190.9	8.3
5000.0	854.7	10.7	-0.3	46.3	1046.2	656.9	172.2	10.5
5500.0	839.1	10.0	-0.7	47.2	1029.7	656.1	153.5	1.000261
6000.0	823.9	9.3	-1.0	48.2	1013.5	655.3	134.7	1.000257
6500.0	808.9	8.7	-1.4	49.1	997.5	654.5	123.7	1.000253
7000.0	794.1	8.0	-1.8	50.0	981.8	653.1	126.9	1.000248
7500.0	779.7	7.3	-2.2	51.0	966.3	652.9	133.3	1.000244
8000.0	765.5	6.6	-2.6	51.9	951.1	652.0	143.1	1.000240
8500.0	751.4	5.7	-4.2	48.9	936.7	651.0	86.2	1.000236
9000.0	737.6	5.6	-5.8	43.6	919.9	650.8	353.0	1.000231
9500.0	723.9	6.7	-6.7	37.8	899.5	652.0	330.7	1.000224
10000.0	710.4	6.0	-7.5	37.3	885.0	651.2	325.7	1.000221
10500.0	697.2	5.3	-8.2	36.9	870.7	650.4	326.6	1.000218
11000.0	684.2	4.7	-9.0	36.5	856.6	649.6	327.1	1.000214
11500.0	671.5	4.0	-9.7	36.1	842.9	640.8	323.0	1.000210
12000.0	659.0	3.3	-10.5	35.7	829.2	647.9	320.4	1.000206
12500.0	646.7	2.6	-11.2	35.3	815.8	647.1	320.7	1.000202
13000.0	634.7	2.0	-12.0	34.9	802.6	646.3	322.3	1.000201
13500.0	622.9	1.3	-12.7	34.5	789.7	645.5	324.9	1.000198
14000.0	611.3	0.6	-13.5	34.0	776.9	644.7	328.4	1.000195
14500.0	599.9	-0.1	-14.2	33.6	764.4	643.9	332.3	1.000191
15000.0	588.7	-0.7	-15.0	33.2	752.1	643.0	334.3	1.000187
15500.0	577.6	-1.6	-15.7	33.4	740.3	642.0	335.9	1.000184
16000.0	566.6	-2.7	-16.3	34.3	729.0	640.8	335.8	1.000171
16500.0	555.8	-3.7	-16.9	35.2	717.9	639.5	335.6	1.000168
17000.0	545.2	-4.7	-17.6	36.1	706.9	638.3	337.4	1.000166
17500.0	534.8	-5.8	-18.2	37.0	696.2	637.0	339.6	1.000163
18000.0	524.6	-6.8	-18.9	37.9	685.6	635.7	343.0	1.000160

STATION ALTITUDE 3989.00 FEET MSL  
24 OCT. 68 0705 HRS MDI  
ASCENSION NO. 868

UPPER AIR DATA  
0800003904  
WHITE SANDS SITE

WSTM SITE COORDINATES  
40°53'00.0000E  
105°04'5.0000N

TABLE X (cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEWEPOINT DEGREES CENTIGRADE	REL.HUM. PERCENT	SPEED OF SOUND/CUBIC METER KNOTS	WIND DATA DIRECTION DEGREES (TN)	INDEX OF REFRACTION
18500.0	514.4	-7.4	-20.2	35.3	673.8	346.5
19000.0	504.5	-7.9	-21.6	32.5	662.0	334.5
19500.0	494.7	-8.4	-23.2	29.5	550.6	333.5
20000.0	485.1	-9.2	-25.5	25.5	640.0	332.8
20500.0	475.5	-10.3	-26.6	25.1	629.9	331.9
21000.0	466.1	-11.4	-27.5	25.2	620.0	330.2
21500.0	456.8	-12.5	-28.4	25.3	610.3	620.0
22000.0	447.8	-13.6	-29.2	25.5	600.7	627.5
22500.0	438.9	-14.7	-30.2	25.6	591.4	636.2
23000.0	430.2	-15.8	-31.1	25.7	582.1	624.0
23500.0	421.7	-16.9	-32.0	25.8	573.1	623.5
24000.0	413.3	-18.0	-32.9	26.0	564.1	622.1
24500.0	404.9	-19.2	-33.9	26.2	555.3	620.6
25000.0	396.4	-20.5	-35.0	26.5	546.5	619.0
25500.0	388.0	-21.9	-36.0	26.8	537.9	617.3
26000.0	379.9	-23.2	-37.1	27.2	529.4	615.6
26500.0	371.9	-24.6	-38.1	27.5	514.1	614.0
27000.0	364.1	-25.9	-39.2	27.8	513.0	612.3
27500.0	356.4	-27.2	-40.3	28.1	504.9	610.7
28000.0	348.9	-28.6	-41.4	28.4	497.0	609.0
28500.0	341.6	-29.9	-42.5	28.8	489.3	607.3
29000.0	334.4	-31.3	-43.6	29.1	481.7	605.6
29500.0	327.4	-32.6	-44.6	29.4	474.2	603.9
30000.0	320.5	-34.0	-45.7	29.7	466.8	602.2
30500.0	313.8	-35.3	-46.8	30.1	454.6	600.6
31000.0	307.2	-36.6	-48.0	30.4	452.3	598.9
31500.0	300.8	-38.0	-49.1	30.7	445.5	597.1
32000.0	294.4	-39.3	-50.3	30.7**	436.6	495.4
32500.0	287.8	-40.6	-52.4	37.3**	431.1	573.0
33000.0	281.3	-41.9	-54.7	23.9**	423.8	592.2

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL  
24 OCT. 68 0705 HRS MDT  
ASCENSION NO. 868

UPPER AIR DATA  
0800003904  
WHITE SANDS SITE

WSTM SITE COORDINATES:  
40°58'0.000E  
105°45.000N

TABLE X (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEWPONT CENTIGRADE			REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES( TN )	SPEED KNOTS	INDEX OF REFRACTION
		DEGREES	DEGREES	CENTIGRADE						
33500.0	275.0	-43.1	-57.0	20.4**	20.4**	416.6	590.5	34.3	6.8	1.000093
34000.0	268.8	-44.4	-59.6	17.0**	409.5	588.9	6.7	37.6	1.000091	
34500.0	262.8	-45.7	-62.3	13.6**	402.5	587.2	6.7	40.8	1.000090	
35000.0	256.9	-47.0	-65.5	10.2**	395.7	585.6	7.5	37.3	1.000088	
35500.0	251.1	-48.3	-69.5	6.8**	389.0	583.9	12.3	33.9	1.000087	
36000.0	245.5	-49.5	-75.1	3.4**	382.4	582.3	15.2	34.1	1.000085	
36500.0	239.9	-50.8	0.	-0.**	376.0	580.6	18.0	34.4	1.000084	
37000.0	234.2	-52.0	0.	-0.**	369.0	579.1	19.7	35.9	1.000082	
37500.0	228.7	-53.1	0.	-0.**	362.2	577.5	21.6	37.2	1.000081	
38000.0	223.3	-54.3	0.	-0.**	355.4	576.0	24.4	37.9	1.000079	
38500.0	218.0	-55.5	0.	-0.**	348.9	574.5	26.8	38.9	1.000078	
39000.0	212.8	-56.6	0.	-0.**	342.4	572.9	27.9	41.7	1.000076	
39500.0	207.7	-57.8	0.	-0.**	336.1	571.4	28.9	44.1	1.000075	
40000.0	202.8	-59.0	0.	-0.**	329.9	569.8	28.8	41.2	1.000073	
40500.0	198.0	-60.1	0.	-0.**	323.9	568.3	28.7	38.3	1.000072	
41000.0	193.3	-61.3	0.	-0.**	317.9	566.7	26.4	39.0	1.000071	
41500.0	188.7	-62.5	0.	-0.**	312.1	565.2	23.8	40.2	1.000069	
42000.0	184.2	-63.6	0.	-0.**	306.4	563.6	26.4	40.4	1.000068	
42500.0	179.7	-64.7	0.	-0.**	300.3	562.2	32.1	39.9	1.000067	
43000.0	175.2	-65.7	0.	-0.**	294.3	560.8	35.3	40.4	1.000066	
43500.0	170.8	-66.8	0.	-0.**	288.4	559.4	35.1	42.1	1.000064	
44000.0	166.5	-67.8	0.	-0.**	282.6	557.9	35.1	43.1	1.000063	
44500.0	162.4	-68.9	0.	-0.**	276.9	556.5	35.8	42.5	1.000062	
45000.0	158.3	-69.9	0.	-0.**	271.4	555.1	35.8	41.8	1.000060	
45500.0	154.4	-71.0	0.	-0.**	266.0	553.6	27.9	40.6	1.000059	
46000.0	150.5	-72.0	0.	-0.**	260.7	552.2	20.0	39.5	1.000058	
46500.0	146.7	-72.9	0.	-0.**	255.3	551.0	15.1	39.1	1.000057	
47000.0	143.0	-71.6	0.	-0.**	247.3	552.7	10.7	38.9	1.000055	
47500.0	139.4	-70.7	0.	-0.**	239.8	554.1	3.8	37.8	1.000053	
48000.0	135.8	-71.1	0.	-0.**	234.3	553.5	36.3	36.3	1.000052	

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
 24 OCT. 68 0705 HRS MDT  
 ASCENSION NO. 868

UPPER AIR DATA  
 WHITF 1003904  
 SITE 1 SIT+

SITE COORDINATES  
 488580.00FEET E  
 185045.00FEET N

TABLE X (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEWEPOINT DEGREES CENTIGRADE	REL.HUM. PERCENT	DENSITY CM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DIRECTION DEGREES(TN)	WIND SPEED KNOTS	INDEX OF REFRACTION
48500.0	132.4	-71.6	0.	-0.	**	228.8	552.8	348.2
49000.0	129.0	-72.0	0.	-0.	**	223.5	552.2	35.9
49500.0	125.8	-72.5	0.	-0.	**	218.3	551.6	340.3
50000.0	122.6	-71.8	0.	-0.	**	212.1	552.5	341.6
50500.0	119.5	-69.8	0.	-0.	**	204.8	555.2	343.1
51000.0	116.5	-68.2	0.	-0.	**	198.0	557.5	348.1
51500.0	113.6	-68.1	0.	-0.	**	193.0	557.6	353.2
52000.0	110.8	-68.0	0.	-0.	**	188.1	557.7	354.2
52500.0	108.0	-68.0	0.	-0.	**	183.4	557.8	354.3
53000.0	105.3	-67.9	0.	-0.	**	178.8	557.9	354.5
53500.0	102.7	-67.8	0.	-0.	**	174.2	558.0	354.7
54000.0	100.1	-67.2	0.	-0.	**	169.4	558.8	355.1
54500.0	97.7	-66.4	0.	-0.	**	164.6	559.9	355.7
55000.0	95.3	-65.6	0.	-0.	**	159.9	560.9	356.3
55500.0	92.9	-64.8	0.	-0.	**	155.4	562.0	356.9
56000.0	90.6	-64.7	0.	-0.	**	151.4	562.2	357.5
56500.0	88.4	-65.0	0.	-0.	**	147.9	561.8	357.4
57000.0	86.2	-65.2	0.	-0.	**	144.5	561.5	356.5
57500.0	84.1	-65.5	0.	-0.	**	141.1	561.1	355.6
58000.0	82.0	-65.8	0.	-0.	**	137.8	560.7	354.5
58500.0	80.0	-65.4	0.	-0.	**	134.2	561.3	353.4
59000.0	78.1	-64.9	0.	-0.	**	130.6	561.9	353.3
59500.0	76.1	-64.5	0.	-0.	**	127.1	562.5	353.4
60000.0	74.3	-64.2	0.	-0.	**	123.9	562.9	353.7
60500.0	72.5	-64.2	0.	-0.	**	120.8	562.9	354.5
61000.0	70.7	-64.2	0.	-0.	**	117.9	562.9	355.3
61500.0	69.0	-64.2	0.	-0.	**	1115.0	562.9	356.0
62000.0	67.3	-64.2	0.	-0.	**	112.2	562.9	356.7
62500.0	65.6	-64.2	0.	-0.	**	109.4	562.9	1.2
63000.0	64.0	-64.2	0.	-0.	**	106.8	562.9	11.7
								11.4

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
24 OCT. 68 0705 HRS MDT  
ASCENSION NO. 658

UPPER AIR DATA  
08000003904  
WHITE SANDS SITE

TABLE X (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEWPOINT DEGREES CENTIGRADI-	REL. HUM. PERCENT	WIND DATA		INDEX OF REFRACTION
				GM/CUBIC METER	SOUND KNOTS	
63500.0	62.5	-63.1	0*	103.6	564.3	1.000023
64000.0	61.0	-60.0	0*	99.6	568.5	1.000022
64500.0	59.5	-50.3	0*	97.4	560.0	1.000022
65000.0	58.1	-60.6	0*	95.2	567.6	1.000021
65500.0	56.7	-61.0	0*	93.0	567.2	1.000021
66000.0	55.3	-61.3	0*	90.9	466.8	1.000020
66500.0	54.0	-61.6	0*	88.0	566.4	1.000020
67000.0	52.7	-61.1	0*	85.5	567.1	1.000019
67500.0	51.4	-60.5	0*	84.3	567.7	1.000019
68000.0	50.2	-60.0	0*	82.1	568.4	1.000018
68500.0	49.0	-59.5	0*	79.9	569.1	1.000018
69000.0	47.8	-59.0	0*	77.8	569.8	1.000017
69500.0	46.7	-58.5	0*	75.8	570.5	1.000017
70000.0	45.6	-58.0	0*	73.8	571.2	1.000016
70500.0	44.5	-57.4	0*	71.9	571.9	1.000016
71000.0	43.4	-56.9	0*	70.0	572.6	1.000016
71500.0	42.4	-56.7	0*	68.2	572.9	1.000015
72000.0	41.4	-56.6	0*	66.6	573.0	1.000015
72500.0	40.4	-56.5	0*	65.0	573.1	1.000014
73000.0	39.5	-56.5	0*	63.5	573.7	1.000014
73500.0	38.5	-56.4	0*	62.0	574.1	1.000014
74000.0	37.6	-56.3	0*	60.5	574.7	1.000013
74500.0	36.9	-56.3	0*	59.0	575.1	1.000013
75000.0	35.9	-56.2	0*	57.6	575.5	1.000013
75500.0	35.0	-56.1	0*	56.3	573.6	1.000013
76000.0	34.2	-56.1	0*	54.9	573.7	1.000012
76500.0	33.4	-56.0	0*	53.6	573.8	1.000012
77000.0	32.6	-55.9	0*	52.3	573.9	1.000012
77500.0	31.9	-55.9	0*	51.1	574.0	1.000011
78000.0	31.1	-55.8	0*	49.9	574.1	1.000011

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
 24 OCT. 68 0705 HRS MDT  
 ASCENSION NO. 868

UPPER AIR DATA  
 0800003904  
 WHITE SANDS SITE

WSRM SITE COORDINATES  
 480580.00E 185045.00N

TABLE X (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREE POINT DEGREES CENTIGRADE	REL.HUM. PERCENT	SPEED OF SOUND KM/CUBIC METER	WIND DATA DIRECTION DEGREES(TIN) KNOTS	INDEX OF REFRACTION
78500.0	30.4	-55.7	0.	-0.	48.7 574.1	5.0
79000.0	29.7	-55.4	0.	-0.	47.5 574.6	6.0
79500.0	29.0	-54.8	0.	-0.	46.2 575.4	6.5
80000.0	28.3	-54.2	0.	-0.	45.0 576.2	5.8
80500.0	27.6	-53.6	0.	-0.	43.9 577.0	5.2
81000.0	27.0	-53.0	0.	-0.	42.7 577.7	4.7
81500.0	26.4	-53.3	0.	-0.	41.8 577.3	5.1
82000.0	25.7	-53.7	0.	-0.	40.9 576.8	5.4
82500.0	25.1	-54.0	0.	-0.	40.0 576.4	5.7
83000.0	24.6	-54.4	0.	-0.	39.1 576.0	5.8
83500.0	24.0	-54.7	0.	-0.	38.3 575.5	5.9
84000.0	23.4	-55.0	0.	-0.	37.4 575.1	6.4
84500.0	22.9	-55.4	0.	-0.	36.6 574.6	7.8
85000.0	22.3	-55.7	0.	-0.	35.8 574.2	9.2
85500.0	21.8	-56.1	0.	-0.	35.0 573.7	10.5
86000.0	21.3	-56.4	0.	-0.	34.3 573.3	11.5
86500.0	20.8	-56.5	0.	-0.	33.5 573.2	12.5
87000.0	20.3	-56.1	0.	-0.	32.6 573.6	13.5
87500.0	19.9	-55.8	0.	-0.	31.8 574.1	14.8
88000.0	19.4	-55.4	0.	-0.	31.0 574.6	16.1
88500.0	18.9	-55.0	0.	-0.	30.3 575.1	17.4
89000.0	18.5	-54.7	0.	-0.	29.5 575.5	18.5
89500.0	18.1	-54.3	0.	-0.	28.8 576.0	19.4
90000.0	17.6	-54.0	0.	-0.	28.0 576.5	20.4
90500.0	17.2	-53.6	0.	-0.	27.4 576.9	21.3
91000.0	16.8	-53.3	0.	-0.	26.7 577.4	21.8
91500.0	16.4	-52.9	0.	-0.	26.0 577.9	22.3
92000.0	16.1	-52.6	0.	-0.	25.4 578.3	22.8
92500.0	15.7	-52.4	0.	-0.	24.8 578.5	23.3
93000.0	15.3	-52.4	0.	-0.	24.2 578.6	24.0

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
24 OCT. 65 0705 HRS MDL  
ASCENSION NO. 868

UPPER AIR DATA  
0800003904  
WHITE SANDS SITE

WEST COORDINATES  
480500.00FEET E  
105045.00FEET N

TABLE X (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEWPOINT DEGREES CENTIGRADE	REL.HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DIRECTION DEGREES(TW)	WIND SPEED KNOTS	INDEX OF REFRACTION
93500.0	15.0	-52.3	0.	23.6	578.7	261.9	24.6	1.000005
94000.0	14.6	-52.2	0.	23.1	578.7	261.8	25.3	1.000005
94500.0	14.3	-52.2	0.	22.5	578.8	260.7	25.5	1.000005
95000.0	14.0	-52.1	0.	22.0	578.9	259.4	25.6	1.000005
95500.0	13.6	-52.0	0.	21.5	579.0	258.1	25.7	1.000005
96000.0	13.3	-52.0	0.	21.0	579.1	257.3	25.8	1.000005
96500.0	13.0	-51.9	0.	20.5	579.2	258.0	25.8	1.000005
97000.0	12.7	-51.8	0.	20.0	579.3	258.6	25.9	1.000004
97500.0	12.4	-51.8	0.	19.6	579.4	259.2	26.0	1.000004
98000.0	12.1	-51.7	0.	19.1	579.5	259.2	27.0	1.000004
98500.0	11.9	-51.6	0.	18.6	579.5	258.9	28.3	1.000004
99000.0	11.6	-51.6	0.	18.2	579.6	258.6	29.6	1.000004
99500.0	11.3	-51.5	0.	17.8	579.7	258.3	31.0	1.000004
100000.0	11.1	-51.4	0.	17.4	579.8	258.0	32.5	1.000004
100500.0	10.8	-51.1	0.	17.0	580.3	257.7	34.0	1.000004
101000.0	10.6	-50.6	0.	16.5	580.9	257.4	35.5	1.000004
101500.0	10.3	-50.2	0.	16.1	581.4	257.9	36.1	1.000004
102000.0	10.1	-49.7	0.	15.7	582.0	258.8	36.2	1.000004
102500.0	9.9	-49.3	0.	15.4	582.6	259.8	36.3	1.000003
103000.0	9.6	-48.9	0.	15.0	583.1	260.7	36.4	1.000003
103500.0	9.4	-48.4	0.	14.6	583.7	261.6	36.6	1.000003
104000.0	9.2	-48.0	0.	14.3	584.3	262.4	36.8	1.000003
104500.0	9.0	-47.6	0.	13.9	584.8	263.2	37.0	1.000003
105000.0	8.8	-47.1	0.	13.6	585.4	263.3	36.2	1.000003
105500.0	8.6	-46.7	0.	13.2	586.0	261.8	33.6	1.000003
106000.0	8.4	-46.2	0.	12.9	586.5	260.3	31.0	1.000003
106500.0	8.2	-45.8	0.	12.6	587.1	258.8	28.4	1.000003
107000.0	8.0	-45.4	0.	12.3	587.7	12.0	588.2	1.000003
107500.0	7.9	-44.9	0.	11.7	588.8	11.7	588.8	1.000003
108000.0	7.7	-44.5	0.					

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
24 OCT. 68 0705 HRS MDT  
ASCENSION NO. 868

UPPER AIR DATA  
0800003904  
WHITE SANDS SITE

WSTM SITE COORDINATES  
488580.00FEET E  
185045.00FEET N

GEOMETRIC ALTITUDE FEET	PRESSURE MILLIBARS	TEMPERATURE DEGREES	AIR DEWPOINT CENTIGRADE	REL.HUM. PERCENT	SPEED OF SOUND METER KNOTS	WIND DATA DIRECTION DEGREES(TN)	WIND SPEED KNOTS	INDEX OF REFRACTION
108500.0	7.5	-44.1	0.	-0. **	11.4	589.4		1.000003
109000.0	7.3	-43.6	0.	-0. **	11.1	589.9		1.000002
109500.0	7.2	-43.2	0.	-0. **	10.9	590.5		1.000002

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
24 OCT. 68 0705 HRS MDT  
ASCENSION NO. 868

MANDATORY LEVELS  
08000003904  
WHITE SANDS SITE

WSTM SITE COORDINATES  
43°31'30" COFFEE E  
103°045.00FEET N

TABLE XI

PRESSURE MILLIBARS	GEOPOTENTIAL FEET	TEMPERATURE DEGREES CENTIGRADE	REL.HUM. PERCENT	WIND DATA		
				AIR DEPOINT DEGREES	DIRECTION DEGREES( TN )	SPEED KNOTS
850.0	5154.	10.5	-0.4	47.	166.3	11.2
800.0	6805.	8.2	-1.7	50.	125.7	11.2
750.0	8546.	5.6	-4.4	49.	76.9	3.7
700.0	10401.	5.5	-8.1	37.	326.4	11.1
650.0	12379.	2.8	-11.0	35.	320.6	16.8
600.0	14494.	-0.1	-14.2	34.	332.3	17.3
550.0	16764.	-4.3	-17.3	36.	336.5	18.6
500.0	19209.	-8.1	-22.3	31.	352.4	21.6
450.0	21870.	-13.3	-29.4	7.5.	355.0	26.6
400.0	24775.	-20.0	-34.5	4.6.	353.8	28.8
350.0	27971.	-28.4	-41.2	25.	355.5	30.7
300.0	31525.	-38.1	-49.2	31.	5.8	26.8
250.0	35551.	-48.5	-70.3	6.**	13.0	33.9
200.0	40246.	-59.7	0.	-0.**	28.7	39.3
175.0	42945.	-65.8	0.	-0.**	35.3	40.5
150.0	45970.	-72.2	0.	-0.**	18.9	39.3
125.0	49499.	-72.6	0.	-0.**	340.6	36.1
100.0	53882.	-67.2	0.	-0.**	355.1	29.4
80.0	58335.	-65.4	0.	-0.**	353.4	22.1
70.0	61013.	-64.2	0.	-0.**	355.6	17.7
60.0	64121.	-60.2	0.	-0.**	23.8	8.8
50.0	67841.	-59.9	0.	-0.**	67.7	3.3
40.0	72460.	-56.5	0.	-0.**	118.5	1.3
30.0	78460.	-55.7	0.	-0.**	166.9	5.5
25.0	82300.	-54.1	0.	-0.**	222.4	5.7
20.0	86966.	-55.9	0.	-0.**	285.6	14.3
15.0	93031.	-52.3	0.	-0.**	261.9	24.6
10.0	101666.	-49.6	0.	-0.**	259.1	36.2

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

RELEASE TIME (MDT)	PIBAL	SECOND-STAGE IMPACT DISPLACEMENT IN MILES DUE TO WIND						THEORETICAL IMPACT FROM LAUNCHER (IN MILES)		
		15-216 FT	216-400 FT	40000-69330 FT	WIND	N-S	E-W			
RAWIN- SONDE		N-S	E-W	N-S	E-W	N-S	E-W	RANGE	N-S	E-W
0350	0507	10.6S	2.3W	13.1S	10.2E	15.7N	12.3F	8.0S	24.1E	359.7
0350	0517	12.3S	1.5W	14.4S	16.5E	15.7N	12.3E	11.0S	27.3E	357.6
0350	0552	8.9S	2.0W	14.5S	14.9E	15.7N	12.3E	7.7S	25.2E	359.4
0350	0610	8.1S	2.7W	15.2S	12.8E	15.7N	12.3E	7.6S	22.6E	358.3
0350	0620	8.3S	3.3W	13.2S	12.3E	15.7N	12.3E	5.8S	21.3E	357.5
0350	0630	7.3S	3.7W	15.8S	14.0E	15.7N	12.3E	7.4S	22.6E	358.5
0350	0640	6.5S	0.1W	13.7S	11.4E	15.7N	12.3E	4.5S	23.6E	359.3
0350	0650	6.7S	2.1W	14.2S	9.7E	15.7N	12.3E	5.7S	19.9E	356.4
0735*	0705*	4.8S	3.2W	13.4S	10.0E	15.3N	9.4E	2.9S	16.2E	353.9

\*Post-Shoot Data

LAUNCHER SETTING (ELEVATION 34.4 DEGREES QE)	AZI-MUTH (DEG-REES)	MILES FROM LAUNCHER	
	RANGE	N-S	E-W
NO WIND IMPACT	343.0	84.3	78.6N 19.6W
PREDICTED SECOND-STAGE IMPACT	358.0	71.0	71.0N 2.5W
SECOND-STAGE IMPACT, RECOVERY	348.9	90.3	89.6N 17.5W
PREDICTED BOOSTER IMPACT	356.0	1.1	1.1N 0.8W
ACTUAL BOOSTER IMPACT	N/A	N/A	N/A

TABLE XII. IMPACT PREDICTION DATA  
NINE-HYDAC STV, SR-077

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17. ABSTRACT  <p>Metereological data gathered for the launching of Nike-Hydac STV, SR-077, are presented for the Space and Missile Systems Organization, AFMDC, Holloman Air Force Base, New Mexico, and for ballistic studies. The data appear, along with calculated ballistic data, in tabular form.</p>			

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1d. KEY WORDS	LINK A		LINK B		LINK C	
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1. Ballistics 2. Meteorology 3. Wind						

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